

Claims.

1. (currently amended) Butt-joining method comprising:

In two abutting metal strips punching a substantially rectangular slot into both abutments, inserting into said two slots a deformable slug, clinching ~~it~~ said slug into said slots,

5 thereby securely joining said strips.

2. (original) Butt-joining method as defined in claim 1 wherein said slots in both said abutments are keystone shaped instead of rectangular.

3. (original) Butt-joining method as defined in claim 1 wherein said slots in both said abutments have two rounded edges produced by both a punch and a die.

10 4. (currently amended) Butt-joining method as defined in claim 1 wherein said strips are of other material ~~then~~ than metal.

5. (original) Butt-joining method as defined in claim 1 wherein a plurality of slots are used.

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6. ~~(currently amended) Butt joining method as defined in claim 2 wherein~~
~~said keystone shaped slugs slots are also having have said two rounded corners edges~~
15 ~~produced by both a punch and a die.~~

7. (currently amended) Butt-joining clinch method comprising:

In two abutting metal strips punching a substantially rectangular slot into both abutments, using one knock-out-slug from said punching, re-inserting said slug into the center of both said abutments, clinching ~~it~~ said slug into said slots thereby securely joining said strips.

20 8. (original) Butt-joining clinch method as defined in claim 7 wherein said slots in both said abutments is keystone shaped instead of rectangular.

9. (original) Butt-joining clinch method as defined in claim 7 wherein said slots in both said abutments have two rounded edges produced by both a punch and a die.

10. (currently amended) Butt-joining clinch method as defined in claim 7 wherein said
25 strips are of other material ~~then~~ than metal.



11. (original) Butt-joining clinch method as defined in claim 7 wherein
a plurality of slots is used.
12. (currently amended) Butt-joining clinch method as defined in claim 7 wherein
~~said~~ clinching height produced by said clinching is flush or slightly below
5 the surface of said strips.
13. (currently amended) Butt-joining clinch method as defined in claim 7 wherein
said metal strips are mitered at 45 degrees and ~~abutting~~ abutted at said mitering,
with four said mitered strips forming a frame.
14. (currently amended) Butt-joining clinch method as defined in claim 13 wherein
10 during said mitering remnants of said metal strips is purposely left ~~in the mitered corner.~~
in said mitering.
15. (new, replaces claim 6) Butt-joining method comprising:
In two abutting metal strips punching a substantially keystone shaped slot into both abutments
inserting into said two slots a deformable slug, clinching said slug into said slots,
15 thereby securely joining said strips.



The present invention.

It is the object of the present invention to provide a joining method that can be totally flat with a low cost manufacturing process that is similar in nature to a stamping-press method. This method is rapid and the most cost effective of basically all manufacturing methods.

- 5 This joining method of the present invention can be done without purchasing rivets or fasteners. Can be of other material than metal, if desired this clinching method could also be modified to work on malleable material.

It could be described as a:

Butt-joining method comprising:

- 10 in two abutting metal strips punching a substantially rectangular slot into both abutments, inserting into said two slots a deformable slug, clinching it into said slots, thereby securely joining said strips.

It could also be described as a:

Butt-joining clinch method comprising:

- 15 In two abutting metal strips punching a substantially rectangular slot into both abutments, using one knock-out-slug from said punching, re-inserting said slug into the center of said abutment, clinching it into said slots, thereby securely joining said strips.

Both the rectangular slots could have a slight keystone shape instead of having a strict rectangular shape, to further enhance the holding force during a pull-apart test

- 20 of the joined strips. When a male punch initially enters a material on its downward stroke, it will be rounding (or coining) the material on its top side before the punch cuts through the material. If the female die is designed with a protruding lip around the periphery of the die opening a similar rounding takes place on the bottom side of the material. This rounding is filled in with material from the slug when it is compressed or clinched into the slots.

- 25 Both of these rounding features are, without added cost, therefore used in the present invention to further enhance the holding force and to make a securely attached clinch joining method.

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